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ABSTRACT

The educational needs of 73 children who exhibited characteristics associated with autism were studied. Ss were children clinically diagnosed as autistic and having severe communication and behavior disorders. Trained observers completed behavioral observations, teacher interviews, student record reviews, and behavior and language questionnaires. Teachers also completed the questionnaires. Twenty-seven Ss were judged autistic without reservation, 11 were judged autistic with reservation, 10 were judged nonautistic with reservation, and 25 were judged nonautistic. For each child the observers further determined the most appropriate program delivery option and support services, the need for a data based behavior program, and communication level. The distribution by age, county of residence, and communication level suggested the need for five self contained categorical classes (or equivalent programing) for autistic students. Inservice recommendations were also made. (CL)

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AUTISM: ASSESSMENT OF NEEDS WITHIN HEARTLAND EDUCATION AGENCY

A Study Committee Report

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November, 1979

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AUTISM:

ASSESSMENT OF NEEDS WITHIN HEARTLAND EDUCATION AGENCY

Study Conducted During The
1978-79 School Year

ABSTRACT The educational needs of children who exhibited characteristics associated with autism were studied. Subjects were children (1) clinically diagnosed as autistic and (2) with severe disorders of communication and behavior. Trained observers completed behavioral observations, interviews with teachers, reviews of student records, and behavior and language questionnaires. Teachers also completed the questionnaires. Treatment of data prior to analysis included (1) "autistic" judgement made by observer, (2) selection of eleven "universal and specific" characteristics, and (3) verification of the validity of observer judgements. Observers collectively assigned subjects into one of the following groups (I) Autistic Without Reservation, (II) Autistic With Reservation, (III) Non-Autistic With Reservation, and (IV) Non-Autistic; and, for each child determined the most appropriate program delivery option and support services, the need for a data based behavior program, and communication level. Descriptions of Levels of Communication were prepared. "Most appropriate" programs and services were compared with those "presently provided". A distribution of Group I and II subjects by chronological age, county of residence and communication level was presented. This distribution suggested the need for five self-contained categorical for autistic classes or equivalent programming. Recommendations for inservicing local and area education staff were presented.

Study Committee Members:

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A committee studied the educational needs of children who exhibit characteristics associated with children clinically diagnosed as autistic. Results are being used by educational administrators as they respond to the following questions:

Are new programs needed? If so, where?
Are modifications of existing programs needed? If so, where?
What are the fiscal requirements to modify or create new instructional environments?
What support services are needed?
Is the present staff capable of conducting an effective program? If not, what are the fiscal requirements to hire new staff and/or assist existing staff in acquisition of the necessary skills to conduct an effective program?

METHOD

Subjects

Consultants and speech clinicians identified children with severe disorders of communication and behavior.

The Outreach Nurse, Iowa Autism Program, Child Psychiatric Service, University of Iowa, Iowa City, and school psychologists submitted names of students clinically diagnosed autistic.

The survey memo sent to consultants and speech clinicians included a list of characteristic behaviors to consider. To be referred, a child must have exhibited behaviors in two of the following three areas:

- severely impaired speech or complete lack of speech
- impaired or complete lack of relatedness and social inaccessability to children, parents and adults; seeming lack of desire for affection; aloneness; withdrawal.
- unusual reaction to perceptual stimulae, such as seeming not to hear certain sounds and overreacting to others or "looking through" objects, poor eye contact, or inability to perform certain gross and/or fine motor activities.

Students identified through this survey were subjects for this study.

Instruments

Behavior and language questionnaires, a behavioral observation record chart, and a student information and setting observation form were developed for use in collecting data.

Literature relating to identification and diagnosis were the sources used in developing the questionnaires.

Characteristics on the behavior questionnaire were activity level, aggression to others, aggression to self, auditory withdrawal, echolalia, intense staring, mouthing, non-functional objective use, lack of being on task, perseverative actions, perseverative speech, physical withdrawal, vocal noises, property abuse, self-stimulation, tactile withdrawal, and visual withdrawal.

Language questionnaire items were eye contact, people interaction, localization to person, localization of non-speech sound, child's name, one-step commands, two-step commands, comprehends questions, imitation voice intonations, imitation of words, imitation of gestures, laughs, points/shows, vocalizes, babbles, words, word combinations, simple sentences, answers questions, complex or compound sentences, conversation, asks for physical assistance, and asks for verbal information.

Collection of Data

Subjects were assigned by chance to Study Committee members, except for consideration given to location in order to limit the number of committee members going to a school building and/or districts. Also, a subject was not assigned to a member who had previously served that subject. Members completed, between January 8 and February 28, a systematic behavioral observation, an interview with teacher(s), and a review of records. In addition, behavior and language questionnaires completed by teachers were collected. Pertinent information regarding past school experiences and agency evaluations were recorded. Following the site visitation the Study Committee member completed the behavior and language questionnaires.

Prior to the site visitation the study committee conducted practice sessions where students were observed and rated using the prepared forms. These sessions enabled the committee to refine the forms, develop inter-rater reliability, and develop uniformity in administration.

Treatment of Data

It was determined that the following treatment of data was necessary prior to its analysis.

Professional Judgement. Immediately following a child's site visitation the observer made a judgement that the child was autistic without reser-

vation, "possibly" autistic, or not autistic. This professional judgement was made because the committee was not aware of a validated standardized procedure to use in identifying; also, identification requires consideration of many factors, and the best time to make a judgement is when the observer is most knowledgeable of data regarding a specific child.

Universal and Specific Characteristics. In order to specify criteria for use in determining which subjects to consider as autistic the committee selected eleven characteristics "universal and specific" to autism. A characteristic is considered "universal and specific" if it is generally exhibited in children clinically diagnosed as autistic and relatively infrequent in children who are not autistic. The characteristics were selected from behavior and language questionnaire items. Each of the five observers selected those characteristics they considered "universal and specific". The chairperson used criteria presented by Rutter (1978) to select characteristics and the criteria used by the National Society for Autistic Children (1978) to select another set of characteristics. If a characteristic was selected by five of the above seven criteria it was considered "universal and specific".

The following characteristics were selected:

Behavior Questionnaire items (Observed Frequently)
- Activity Level
- Echolalia
- Intense Staring
- Non-Functional Object Use
- Perseverative Actions
- Perseverative Speech
- Self Stimulation

Language Questionnaire Items (Not Or Seldom Observed)
- Eye Contact
- People Interaction
- Imitation of Gestures
- Laughs

Verification of Study Committee Judgements. A test of significance (ANOVA) was conducted between thirteen subjects who were previously diagnosed by a clinic as autistic and fourteen subjects who were considered autistic without reservation by the study committee observer. There was no evidence of a clinical diagnosis of autism for the latter group. Teacher and observer ratings on the behavior and language questionnaires were used

as raw scores. The test of significance was conducted on each of the eleven "universal and specific" characteristics. Either no significant difference or significance in favor of the observer judged group was considered as verification of the judgements.

There was no significant difference on nine of the characteristics. The two significant differences, "eye contact" and "laughs", were in favor of the observer judged group, i.e. the degree of severity of not exhibiting these characteristics was greater in the observer judged group.

It was concluded that the observer judgements were valid for use in the analysis of data.

Other Characteristics With High Frequency of Occurrence. Other characteristics with high frequency of occurrence in subjects clinically diagnosed as autistic and subjects observer judged as autistic without reservation were listed for use in the analysis of data.

Analysis of Data

The following data, as it pertained to each subject, was available for review by the Study Committee: Present school program and services, chronological age, past school history, evaluations by local and area education agency staff, staffing results, individual education plans, health history as available in cumulative records, clinical and outside professional diagnosis as available in cumulative records, behavioral observation record chart, behavior and language questionnaires completed by observers and teachers, tabulation of ratings on the eleven "universal and specific" items, professional judgement of Study Committee observer, and tabulations of ratings on "characteristics with high frequency of occurrence".

A limitation of this work was that the parents were not contacted to obtain data regarding their child's developmental history.

Assignment Into Groups. The Study Committee, following a collective review of data, assigned each subject into one of the following four groups:

Group I: Autistic Without Reservation
Group II: Autistic With Reservation
Group III: Non-Autistic With Reservation
Group IV: Non-Autistic

The Study Committee recognized that data available for review did not constitute a comprehensive evaluation. However, it was their opinion that if comprehensive evaluations were conducted subjects assigned to Group I would be considered autistic by a staffing team, and that most of the subjects assigned to Group II would be considered autistic by a staffing team. There appeared to be a greater likelihood that some of the Group II subjects would be considered non-autistic, even though they exhibited autistic characteristics. The possibility appeared to exist that some subjects in Group III might be considered autistic by a staffing team. Group IV subjects were considered non-autistic because they did not exhibit autistic characteristics to a sufficient degree or, if exhibited, these behaviors were attributed to age-appropriateness and/or other disabilities. The probability of Group IV subjects being considered autistic by a staffing team appeared minimal.

The Study Committee decided to assign all of the clinically diagnosed subjects (N=13) and the observer judged autistic without reservation subjects (N=24) to Group I Autistic Without Reservation (N=27). The N=24 group included ten subjects who were also clinically diagnosed. Although all remaining subjects were considered for assignment into Group I, none were assigned to that group.

Determination of Most Appropriate Programs and Services. The following determinations for each subject were decided collectively by the Study Committee based on the data available for review:

- Most Appropriate Program Delivery Option
- Most Appropriate Support Services
- Need for Data Based Behavior Program
- Need for Behavioral Aides

The determination of the need for a data based behavior program was based on the instructional and behavior management needs of subjects and a literature review of effective instructional and behavior management methods. A behavioral aide was considered to be needed if the behavior program required systematic observation and charting that exceeded what could be assumed by the classroom teacher and instructional aide.

Assignment of Level of Communication. Based on a review of literature and utilizing the items on the Language Questionnaire, the Study Committee established Level of Communication groups.

Determination of a subject's level of communication was based on Language Questionnaire ratings and input from the Study Committee observer. If needed, all collected data was available for review.

Communication as used in this study includes ability to receive and express language through gestures, actions or oral modes. The level of communication groups are described below:

IA. Non-Verbal: Limited Receptive
- exhibits no expressive communication
- extremely limited understanding of the spoken word

IB. Non-Verbal: High Receptive
- exhibits no expressive communication
- a greater understanding of the spoken word and generalizations to objects more than what is found in group 1A
- no meaningful play with objects and no eye contact

II. Vocalizations (meaningful)
- will echo some sounds when cued by a model but will not echo a whole word
- cannot label spontaneously
- awareness to a few conditioned objects (receptive)
- no meaningful play with objects
- eye contact is inconsistent and limited
- usually, if directed, can learn imitative play

IIIA. Low Verbal (Labelling); Low Receptive
- uses words spontaneously when naming or labelling
- exhibits an ability to imitate sounds
- demonstrates limited ability to associate the verbal label with the object
- extremely limited understanding of the spoken word
- usually plays with objects in a compulsive manner

IIIB. Low Verbal (Labelling); High Receptive
- uses words spontaneously when naming or labelling
- exhibits a good ability to imitate sound and a limited ability to associate the verbal label with the object
- more appropriate understanding of the spoken word
- more appropriate emotion and affect and more awareness to play with objects in a meaningful manner

IVA. High Verbal (Labelling); Low Receptive
- uses simple sentences and words spontaneously when naming or labelling
- might exhibit compound sentences and ask questions
- evidence of some ability to participate in conversation
- gesture language is more meaningful
- more appropriate emotion and effect
- lower occurrence of compulsivity and order for routine
- limited understanding of the spoken word

IVB. High Verbal (Labelling): High Receptive
- Verbal: Same as IVA
- more appropriate understanding of the spoken word and greater generalization of language skills

- students within this group may exhibit a wide range of communication abilities

Comparison Between Programs: Most Appropriate and Presently Provided. This comparison was made to appraise discrepancies between what was considered the most appropriate program delivery option as judged by the committee and the programs presently being provided.

Comparison Between Support Services: Most Appropriate and Presently Provided. This comparison was made to appraise discrepancies between what was considered the most appropriate support services as judged by the committee and the support services presently provided.

Distribution of Subjects By Chronological Age, County of Residence and Communication Level. A distribution by most appropriate program delivery option, chronological age, county of residence, and level of communication for Groups I and II was completed.

RESULTS

The analysis of data, as described earlier, yielded the results presented in this section. Presentation of results is limited, in this paper, to Groups I and II. A separate study committee report has been prepared which includes a complete presentation of results.

Students Referred

Eighty students were referred. Twenty children, 25%, chronological ages of three through six, were being served in preschool programs. No unserved preschool age children were referred. Thirty children, 38%, chronological ages of five through eight, were attending elementary school programs. Thirteen, 16%, were within the nine through twelve age range and seventeen, 21%, were within the twelve through eighteen age range. The sixty students referred from those enrolled in kindergarten through twelfth grade are 0.05% of the total school population. This is an incidence rate of five students per 10,000 enrollment.

Number Judged Autistic

Seventy-three students were included in the study, twenty-seven of these were judged autistic without reservation (Group I), eleven were judged autistic with reservation (Group II), ten were judged non-autistic with reservation (Group III), and twenty-five were judged non-autistic (Group IV).

The thirty-eight students in Groups I and II represent, approximately, 0.03% of the total student population. An incidence rate of three per 10,000.

Comparison Between Programs: Most Appropriate and Presently Provided

Tables 1 and 2 presents this comparison for Groups I and II. Discrepancies between most appropriate program delivery option as judged by the committee and program presently provided are discussed below. None of the twenty-one students in Group I and none of the eleven students in Group II, judged to be in need of a self-contained class with a 1 to 5 teacher/student ratio, are served in a self-contained class specifically designed for autistic children. Twelve of these thirty-two students are served in a program not as intense as a 1 to 5 ratio class; and one was not provided a school program.

Comparison Between Support Services: Most Appropriate and Presently Provided

These comparisons are presented in Table 3 for Groups I and II.

Need for Data Based Behavior Program and Behavioral Aide

All of the students in Groups I and II were judged to be in need of a data based behavior program. Twenty-five of the twenty-seven students in Group I and all of the students in Group II were judged to be in need of a behavioral aide.

Table 4 presents a distribution of behaviors exhibited for Group I. A subject was considered as exhibiting a behavior if both the teacher rater and the observer rater gave the student a rating of 3 (ocassionally observed) or 4 (frequently observed) on the behavior questionnaire. Over fifty percent of the twenty-seven Group I students exhibited the following behaviors: Activity Level (56%), Intense Staring (74%), Non-Functional Object Use (56%), and Self Stimulation (85%).

Level of Communication

Table 5 presents a distribution of levels of communication for Groups I and II.

TABLE 1

Comparison Between Most Appropriate Program and Program Presently Provided: Group I, Autistic Without Reservation, N=27

PROGRAM JUDGED MOST APPROPRIATE	N	STAFFED PRIMARY DISABILITY	PROGRAM PRESENTLY PROVIDED	N
SELF-CONTAINED (CS)[a]	21	MD[b]=11	CS MD	2
		SP=5	CS SP	2
		ED=4	CS ED	1
		CM=1	CS PRE-SCHOOL MULTI[c]	7
			CC MD	3
			CC SP	2
			CC ED	1
			CC PRE-SCHOOL MULTI	1
			SCIN MD	2
SPECIAL CLASS W/ INTEGRATION (SCIN)	1	MD=1	SCIN MD	1
RESOURCE ROOM	1	SPEECH	REGULAR CLASS & SPEECH	1
REGULAR CLASS W/ SUPPLEMENTAL ASSISTANCE	4	ED=4	CC ED	1
			SCIN ED	1
			REG. CL. W/ SUPP. ASST. ED	2

[a] CS refers to self-contained classes 1 to 5 teacher/student ratio. CC refers to self-contained classes 1 to 8 elementary and 1 to 10 secondary teacher/student ratio. SCIN refers to special class with integration, 1 to 12 elementary and 1 to 15 secondary teacher/student ratio. The resource room is 1 to 18 teacher/student ratio.

[b] MD = Mental Disabilities; SP = Severe and Profound; ED = Emotional Disabilities; CM = Communication Disability.

[c] Multi refers to a multi-categorical class that could serve students with any disability, i.e., mental, emotional, communication.

TABLE 2

Comparison Between Most Appropriate Program and Program Presently Provided: Group II, Autistic With Reservation, N=11

PROGRAM JUDGED MOST APPROPRIATE	N	STAFFED PRIMARY DISABILITY	PROGRAM PRESENTLY PROVIDED	N
SELF-CONTAINED (CS)[a]	11	MD=3	CC MD	3
		SP=6	CS SP	6
		CM=1	PRE-SCHOOL MULTI	1
		NOT STAFFED=1	NO SCHOOL PROGRAM	1

a Refer to Table 1 for definitions

TABLE 3

Comparison Between Most Appropriate Support Services
and Support Services Presently Provided

Group I, Autistic Without Reservation, N=27 and
Group II, Autistic With Reservation, N=11

SUPPORT SERVICE	NUMBER JUDGED IN NEED			NUMBER PRESENTLY RECEIVING			PERCENT RECEIVING SERVICE
	Group I	Group II	Total	Group I	Group II	Total	
SS: Clinical Speech	25	11	36	14	3	17	47
PY: Psychological	27	11	38	6	1	7	18
OT: Occupational Therapy	4	4	8	2	3	5	63
PT: Physical Therapy	1	5	6	5	4	9	150
SW: Social Worker	1	2	3	1	1	2	66
Other	0	0	0	9	0	9	--

(Adaptive P.E.)

TABLE 4

DISTRIBUTION OF
BEHAVIORS EXHIBITED

Group I, Autistic Without Reservation, N=27

	NO	%
ACTIVITY LEVEL	15	56
AGGRESSION TO OTHERS	1	4
AGGRESSION TO SELF	2	7
AUDITORY WITHDRAWAL	2	7
ECHOLALIA	5	19
INTENSE STARING	20	74
MOUTHING	8	30
NON-FUNCTIONAL OBJECT USE	15	56
ON TASK, LACK OF BEING	10	37
PERSEVERATIVE ACTIONS	7	26
PERSEVERATIVE SPEECH	6	22
PHYSICAL WITHDRAWAL	1	4
PROPERTY ABUSE	1	4
SELF STIMULATION	23	85
TACTILE WITHDRAWAL	5	19
VISUAL WITHDRAWAL	3	11
VOCAL NOISES	11	41

TABLE 5

Distribution of Levels of Communication for Group I (Autistic Without Reservation) and Group II (Autistic With Reservation)

	N	IA	IB	II	IIIA	IIIB	IVA	IVB
Group I	27	6	2	1	1	2	1	14
Group II	11	4	2	2				3
Total	38	10	4	3	1	2	1	17

Distribution of Subjects By Chronological Age, County of Residence, and Communication Level

Table 6 presents this distribution for subjects residing in the city of Des Moines (which is in Polk County), the remaining school districts in Polk County, and in seven counties adjacent to Polk County. It does not include the three counties in Heartland Education Agency that are not adjacent to Polk County.

DISCUSSION

Results of this study were utilized to prepare a plan for serving subjects in Group I (Autistic Without Reservation) and Group II (Autistic With Reservation). This plan is an expedient attempt to provide information to administrators as they answer questions regarding location of new programs and transportation needs.

The Study Committee recognizes that a number of factors should be considered when children are grouped into special education classes. Some of these factors are chronological age, intelligence, physical condition, motor ability, adaptive behavior, self-help skills, incidence, residence, achievement level, integration, and level of communi-

TABLE 6

DISTRIBUTION BY CHRONOLOGICAL AGE AND LEVEL OF COMMUNICATION: GROUP I AND II SUBJECTS RESIDING IN DES MOINES, POLK COUNTY, AND COUNTIES ADJACENT TO POLK COUNTY JUDGED TO BE IN NEED OF A SELF-CONTAINED CLASS, 1 TO 5 TEACHER/STUDENT RATIO

Chronological Age	Level of Communication						
	IA	IB	II	IIIA	IIIB	IVA	IVB
3	2*		1				1 (Marion)
4	2+1(Polk)**						
5							
6						1	2
7		1(Dallas)					
8	1(Story)						
9		1(Polk)	1				2
10	1(Polk)		1(Marion)				
11							1
12		1		1(Polk)			1(Dallas)
13	2						
14					1		1
15					1		1(Jasper)
16							
17		1					1(Warren)

*Unless otherwise indicated, subjects reside in the Des Moines Independent Community School District.

**County of residence is indicated in parenthesis.

cation. In developing the plan proposed in this section, consideration was given only to the following factors: (1) most appropriate program delivery option as judged by the Study Committee, (2) legal residence, (3) chronological age and (4) level of communication. Consequently, the Study Committee does not propose this as a grouping model. They have not had time to sufficiently review literature nor to validate programs to propose such a model. The literature does include references that support groupings by chronological age and level of communication. Certainly chronological age and communication level will be among the primary determinants of grouping students.

The plan is based on the following assumptions and is accurate only to the extent that these assumptions are accurate: educational program decisions made by the Staffing Team will be congruent with those made by the Study Committee, parents will give consent for placement, transportation will be available, sponsors of classes will accept tuitioned students, and administrators of districts where a subject legally resides will be willing to tuition into a sponsoring district.

Table 7 presents proposed self-contained classes, 1:5 teacher/student ratio, for Group I and Group II subjects residing in Des Moines, Polk County and counties adjacent to Polk County.

The table presents the number of students that would be served in each class. The number within the class of seven to ten year olds would depend on the feasibility of transporting the subjects residing in Story and Marion counties. Distance to travel one way to Des Moines is approximately 41 and 35 miles, respectively.

The maximum age range within a class would be six years and the minimum would be two years. The maximum number of communication levels within a class would be four and the minimum would be two.

For optimal educational programming, the Study Committee recommends location of classes in public school settings where there are regular school classes.

TABLE 7

Proposed Self-Contained Classes, 1 to 5 Teacher/Student Ratio: Number of Students, Chronological Age Range, and Levels of Communication: Group I and Group II Subjects Residing in Des Moines, Polk County, and Counties Adjacent to Des Moines

Number of Classes	Number of Students	Chronological Age Range	Level of Communication
1	6	3-4	IA =5; II = 1
1	4-6*	7-10	IA =2;IB=2; II=2
1	4	12-17	IA =2; IB=2
1	6	6-11	IVA=1; IVB=5
1	7	12-17	IIIA=1; IIIB=2; IVB=4

*The number would depend on the feasibility of transporting two subjects.

RECOMMENDATIONS FOR IN-SERVICE EDUCATION OF STAFF

This study has documented inadequacies and points out the need for changes in special education programs presently serving autistic children. The responsibility to determine the nature and extent of such changes rests with staffing and individual educational planning teams. In so doing, it is important that these teams be knowledgeable of (1) a child's individual educational needs, (2) validated instructional programs, and (3) techniques to plan and implement individualized programs. Specialized training is needed to acquire this knowledge. It is quite likely that staffing teams have not, as yet, received this specialized training. An in-service training plan to provide this training is needed.

The following plan is presented for consideration:

- Establish a multi-disciplinary Autism Resource Team with the following members: Audiologist, Consultant for Emotional Disabilities, Occupational Therapist, Physical Therapist, Psychologist, Social Worker, Speech and Language Clinician, and Teacher.
  Assign the team the following tasks:
  1. Develop an identification and comprehensive evaluation process that specifies measurement instruments and procedures,
  2. Develop instructional and support service programs that can be used by special education teachers, regular class teachers and support staff in planning and effecting individual educational plans to be used in modifying programs presently providing service,
  3. Develop instructional and support service programs which will serve as curricular and individual educational planning guides for the operation of newly established classes,
  4. Develop three training packages, one package for each component listed in 1, 2, and 3 above, for on-site in-service training of LEA and AEA staffing teams,
  5. Plan and implement a continuing in-service education plan through scheduled workshops to increase LEA and AEA staff's knowledge of autism.
- Develop a plan to implement the training packages that utilizes members of the Autism Resource Team in providing the on-site consultative and/or direct services as (1) new classes are started and (2) new individual educational plans are prepared and effected for serving children who will continue to be served in existing programs. The plan should include conditions to be met by local staffing teams prior to entry, guidelines for offering services and in-service training, and a phasing out procedure. The intent would be to train the local LEA and AEA team to perform the tasks of (1) identification and evaluation, (2) planning, implementing, and monitoring the program, and (3) planning, implementing and monitoring individual education plans.
- Set an anticipated time period for utilizing the Autistic Resource Team so that services they provide would gradually be absorbed by other AEA personnel.

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